

Non-Intrusive, Distributed Gas Sensing Technology for Advanced Spacesuits, Phase I

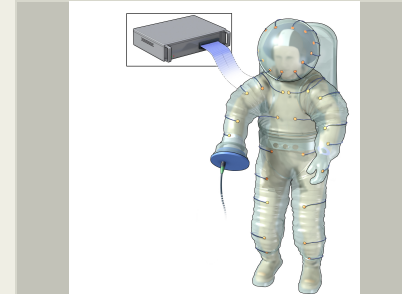
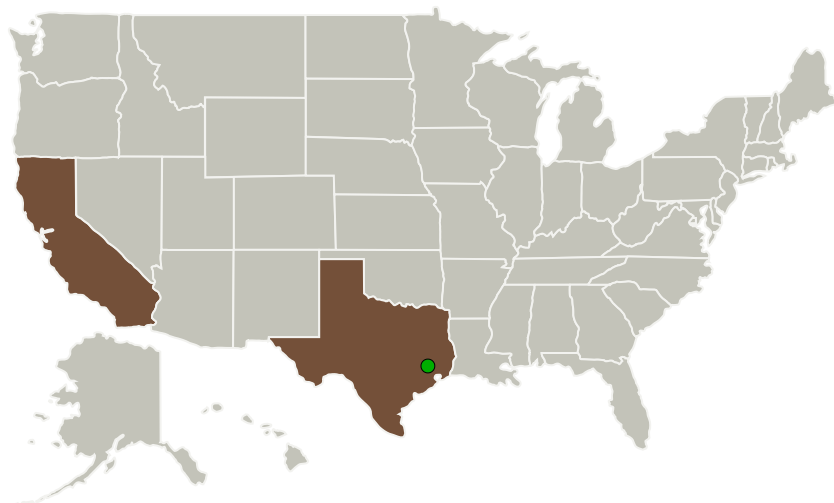
Completed Technology Project (2014 - 2014)



Project Introduction

Advances in spacesuits are required to support the ISS and future human exploration. Spacesuit development and ground-based testing tasks require sensing and analytical instrumentation for characterizing and validating prototypes. While miniature thermosensors measure reliably at low cost, and can be incorporated all around spacesuit prototypes, incorporating gas sensors at locations of interest inside a spacesuit has been a significant challenge – in particular for human subject tests – because of the size and cost of available instrumentation. The sensor probes and cables must not restrict the suit or human subjects' mobility, and must not disturb the gas flow. Intelligent Optical System proposes to develop luminescence-based sensing patches for non-intrusive monitoring of critical life support gas constituents and potential trace contaminants in spacesuits. Flexible sensitive patches inside prototype spacesuits will be interrogated via optical fibers, and will not disturb the gas flow or the human subject. This will give suit engineers great flexibility for choosing multiple sensing points, fitting the sensor elements into the spacesuit, and cost effectively relocating the sensor elements as desired.

Primary U.S. Work Locations and Key Partners



Non-Intrusive, Distributed Gas Sensing Technology for Advanced Spacesuits Project Image

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Organizations Performing Work	Role	Type	Location
Intelligent Optical Systems, Inc.	Lead Organization	Industry	Torrance, California
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations

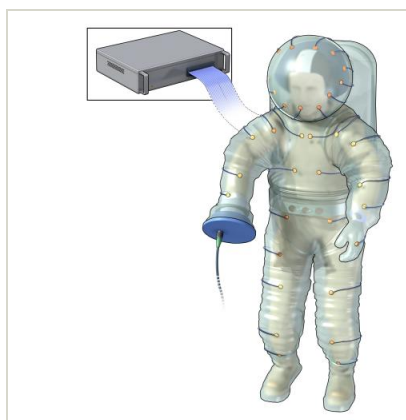
California	Texas
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Project Transitions

**June 2014:** Project Start**December 2014:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/140547>)

Images

**Project Image**

Non-Intrusive, Distributed Gas Sensing Technology for Advanced Spacesuits Project Image
(<https://techport.nasa.gov/image/132843>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Intelligent Optical Systems, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jesus D Alonso

Co-Investigator:

Jesus Delgado Alonso

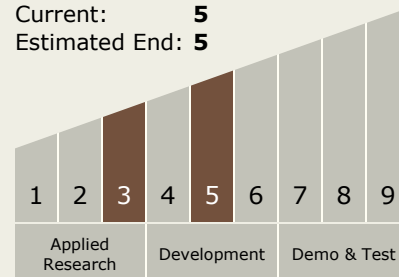
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Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.2 Extravehicular Activity Systems
 - └ TX06.2.2 Portable Life Support System

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System